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THE EFFECT OF MIXTURE (SIDR EXTRACT WITH HYDROGEN PEROXIDE) IN THE DISINFECTION OF HOSPITAL INSTRUMENT

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ABSTRACT

Disinfection means the use of a chemical procedure that eliminates virtually all recognized pathogenic microorganisms but not necessarily all microbial forms (e.g., bacterial endospores) on inanimate objects. Factors that affect the efficacy of both Disinfection include prior cleaning of the object; organic and inorganic load present; type and level of microbial contamination; concentration of presence of biofilms; Temperature and pH of the Disinfection process; and in some cases, relative humidity of the sterilization process (e.g., ethylene oxide). To assess mixing Solution in combating bacterial infection of reusable medical advices and surgical instrument. In this study we used Eighteen pieces of medical advices including 5 tubing system of respirator,5 face masks, 6 laryngoscope blades, 2 stethoscopes (bell and diaphragm parts) of previously using that was collected from Teaching Surgical Hospital in the Hilla City. Rinsed these pieces twice with normal saline. The present study designed to four groups: group one including different weight of sidr leaves aqueous extract 25, 50, 62.5 and 75 g/L, group two: we used 1.5% Hydrogen peroxide only, group three: a mixture of each extracts and 1.5% Hydrogen peroxide were well mixed together, and group four normal saline 0.9% was used as a control. The experiments of decontamination were performed at different times 5, 10, 15 and 30 min for each groups. Swabs were taken from each advice before and after contact with the disinfectants.

The result of present study, showed the mixing 1.5% Hydrogen peroxide and 62.5 g/L sidr was effective in disinfection of used contaminated medical advices at 30 min.

KEYWORDS: Sidr, Disinfection, Hydrogen Peroxide, Medical a Devices

INTRODUCTION

Reusable devices or items that touch mucous membranes should, at a minimum, receive high-level disinfection between patients. Because the vast majority of pathogens are present in organic matter, e.g. visible soil, the first step in reprocessing, cleaning, is the most important[1,2] Any failure to remove soil at this point creates the potential for transmission of infection as the efficacy of subsequent disinfection or sterilization will be compromised. Decontamination is the process by which microorganisms are removed or destroyed in order to render an object safe[3].

Cleaning is the first and most important step in the decontamination process and involves the removal, usually with a detergent and water, of both visible and non-visible soil (such as blood, protein substances, and other debris) from the surface of the medical device. Failure to properly disinfect or sterilize reusable medical equipment carries a risk associated with breach of the host barriers[4]. Nosocomial infections- known also as hospital-acquired infections, hospital-associated infections, and hospital infections-are infections that are not present in the patient at the time of admission to hospital but develop during the course of the stay in hospital[5].

Microorganisms can be transmitted from their source to a new host through direct or indirect contact, in the air, or by vectors. Two basic principles govern the main measures that should be taken in order to prevent the spread of nosocomial infections in health-care facilities: separate the infection source from the rest of the hospital and cut off any route of transmission[6]. Management of health- care waste is an integral part of hospital hygiene and infection control. Health-care waste should be considered as a reservoir of pathogenic microorganisms, which can cause contamination and rise to infection[7].

Ziziphus spina-christi known as Christ's Thorn Jujube, is a native plant that grows in tropical and subtropical regions especially in Middle East[8]. *Zizyphus spina-christi* grows wild in tropical Africa and Asia and can be domesticated. It has folkloric usage in pain related ailments throughout these regions[9].

Zizyphus spina-christi (L) locally known as sidr. Is a multipurpose tree species belonging to the botanical family *Rhamnaceae*., sidr is medicinal plant with many traditional uses[10].

Sidr has several physiological and morphological characteristics that assures its ability to adopt to arid environment[11]. The plant has versed medicinal and nutritional values; plant materials are cheap and significantly contribute to the improvement of human health in terms of cure and prevention of diseases. Sidr have been useful as food and medicine they contain vitamins needed by human body for healthy living[12].

Hydrogen peroxide is a strong oxidant that long has been used in industrial applications and in water treatment processes. When catalyzed in water, hydrogen peroxide may generate a wide variety of free radicals and other reactive species that are capable of transforming or decomposing organic chemicals[13].

MATERIAL AND METHODS

Preparation of Sidr extract: The fresh sidr leaves after being cleaned and washed in tape water, (25, 50, 62.5 and 75) g were collected in separate containers. 1 Liters of distilled water was added to each container and all the samples were heated until boiling. We left the mixture for 12 hrs, rubbing the leaves with the gloved hands; the infusion was collected to be kept in the refrigerator for use.

Preparation of hydrogen peroxide: Hydrogen peroxide 6% liquid solution made by Baghdad Factory, diluted by distilled water to 1.5%. A sample from each concentration was put in separate beakers.

In this study we used Eighteen pieces of medical advices including 5 tubing system of respirator,5 face masks, 6 laryngoscope blades, 2 stethoscopes (bell and diaphragm parts) of previously using that was collected from Teaching Surgical Hospital in the Hilla City. Rinsed these pieces twice with normal slaine. The present study designed to four groups: group one including different weight of sidr leaves aqueous extract 25, 50, 62.5 and 75 g/L, group two: we used 1.5% Hydrogen peroxide only, group three: a mixture of each extracts and 1.5% Hydrogen peroxide were well mixed together, and group four normal saline 0.9% was used as a control. The experiments of decontamination were performed at different times 5, 10, 15 and 30 min for each groups. Swabs were taken from each advices before contact with the disinfectants which were distributed as one swab per agar, 2 nutrient agars, 2 MacConkey's agars and 2 Bile Bacteroides Esculin (BBE) media, The media were cultivated for 48 hours in 37degrees centigrade both in aerobic and anaerobic conditions. The media were put inside anaerobic jar using gaspack.

After contact with the disinfectants, swabs from a device from each group were taken and cultivated the same way and in conditions as just mentioned at different times 5, 10, 15 and 30 minutes.

RESULTS AND DISCUSSIONS

In the United States, approximately 46.5 million surgical procedures and even more invasive medical procedures-including approximately 5 million gastrointestinal endoscopies- are performed each year[4].

Z. spina-christi has several pharmacological functions, including antihyperglycemic, antibacterial, antifungal, antioxidant and antinociceptive activities, Sidr extract has shown significant antibacterial activity against *S. aureus*, *Bacillus subtilis*, *Escherichia coli*, *Proteus vulgaris*, *Pseudomonas aeruginosa*, *Salmonella para typhi B* and *Klebsiella pneumonia*[13].

An antioxidant is defined as „any substance that when present at low concentrations compared to those of an oxidizable substrate, significantly delays or prevents oxidation of that substrate[14].

In this study, The antibacterial mixture of 25, 50 and 75 g/L sidr extract and hydrogen peroxide were not successful in eradicating the contamination of used Pediatric hospital advice whether the time of contact were 5, 10 or 15 minutes.

Mixture of the sidr extract 62.5% with 1.5% hydrogen peroxide was effective only if the period of contact was 30 minutes (Table 1).

Table 1: Effect of Mixture on Growth of Bacteria in Several Types of Medical Advices

Condition	Hydrogen Peroxide 1.5%	Sidr Extract g\L				Mixture of Sidr Extract g\L and Hydrogen Peroxide 1.5%				Normal Saline (Control)
		25	50	62.5	75	25	50	62.5	75	
Aerobic	+	+	+	+	+	+	+	-	+	+
An aerobic	+	+	+	3 colonies	+	+	+	-	+	+

(+): Growth (-): No Growth

Disinfectants are substances that are applied to non-living objects to destroy microorganisms that are living on the objects. A disinfectant solution is considered appropriate when the compromise between the antimicrobial activity and the toxicity of the product is satisfactory for the given application. Disinfection does not necessarily kill all microorganisms, especially resistant bacteria. Disinfection and Sterilization are essential for ensuring that medical and surgical instruments do not transmit infectious pathogens to patients[15].

CONCLUSIONS

The mixing sidr extract 62.5g\L with hydrogen peroxide 1.5% can Disinfected and sterilized the medical a devices and surgical instruments.

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